ELSEVIER

SEMINARS IN PERINATOLOGY

AUTHOR INDEX

Abuhamad, A., 3
Abu-Shaweesh, J.M., 273
Agerberth, B., 304
Ahlfors, C.E., 334
Al-Matary, A., 264
Alvaro, R., 264
Amin, S.B., 340
Andreoli, S.P., 112
Anthony, T., 164
Aranda, J.V., 132

Back, S.A., 405
Bard, H., 312
Bardin, C., 288
Baschat, A.A., 67
Baum, M., 91, 97
Bellemin, K., 312
Bhutani, V.K., 317, 319
Breuer, C., 164
Bukowski, R., 1, 51

Caniano, D.A., 240
Cates, D., 264
Chacon, M., 379
Chevalier, R.L., 124
Cortes, R.B., 199

Dammann, O., 389
Daval, J.-L., 257
Den Ouden, L., 295
Deter, R.L., 23
De Vries, L.S., 279
Doyle, N.M., 174
Drummond, G.S., 365

English, A.M., 312

Farmer, D.L., 199
Fernandez-Twinn, D., 81
Ferriero, D., 425
Fong, P., 164

Gagnon, C., 312
Gardosi, J., 33
Georgeson, K.E., 212
Gittes, G.K., 152
Gourley, G.R., 348
Grobbee, D.E., 279
Groenendaal, F., 279
Gudmundsson, G.H., 304

Hagberg, H., 389
Hales, C.N., 81
Hammerman, C., 356
Haxhiu, M.A., 273
Hecher, K., 67
Henry, M.C.W., 221
Hirschl, R.B., 185
Hu, F., 371

Inder, T.E., 396, 433
Ivascu, F.A., 185

Johnson, L.H., 317, 319
Jones, J.E., 89, 141
Jose, P.A., 89, 141

Kaplan, M., 356
Kappas, A., 365
Kapur, G., 132
Khalil, M., 264
Kutbi, I., 264
Kwiatkowski, K., 264

Lally, K.P., 174
Lam, J.N.G.P., 279
Leviton, A., 389
Lieftink, A.F., 279
Lubec, B., 249

McKee, M., 234
McLean, C., 425
Mallard, C., 389
Martin, R.J., 273
Mattoo, T., 132
Mehta, S.S., 152
Ment, L.R., 379, 444
Moss, R.L., 149, 221

Neil, J.J., 396, 433
Nyberg, D.A., 3

Oh, W., 247
Ozanne, S.E., 81

Papageorgiou, A., 288
Perlman, J.M., 415
Piuze, G., 288
Pollak, A., 249

Quigley, R., 91, 97
Qurashi, M., 264

Rademaker, K.J., 279
Rees, S., 396
Rigatto, H., 264
Rivkees, S.A., 405
Robertson, D.J., 212
Rushing, S., 444

Satlin, L.M., 103
Schwartz, M.L., 379
Shapiro, S.M., 319
Smith, G.C.S., 41
Steer, P., 59
Stevenson, D.K., 317, 326
Stewart, W.B., 379
Strittmatter, S.M., 371

Uiterwaal, C.S.P.M., 279

Vaccarino, F., 379
Van de Bor, M., 295
Van Haastert, I.C., 279
Venigalla, S., 348
Vert, P., 247, 257
Ville, Y., 3
Vreman, H.J., 326

Weitzdoerfer, R., 249
Wennberg, R.P., 334
Wilson, C.G., 273
Wong, R.J., 326

Yan, W.L., 379
Yoder, B., 396

Zhou, H., 103

SUBJECT INDEX

Abdominal circumference (AC), fetal, 37, 72
  adult diseases and, 81
  in IGA, 23, 24, 26-28
  in IUGR, 72
  in macrosomia, 65
  pregnancy dating and, 3-4
Abdominal circumference (AC), fetal, 37, 72 (*Continued*)
  ultrasound estimation of, 3-10, 12-16
Abdominal ultrasound of neonatal cholestasis, 351
Abdominal wall closure for gastroschisis, bedside, in critically ill neonates, 236
ABE, *see* Acute bilirubin encephalopathy, neonatal

Abnormal fetal growth, *see* Fetal growth disorders
Abortion, spontaneous, fetal growth disorders and, 45, 48
ABR, *see* Auditory brainstem evoked response, measurement of bilirubin-induced neurotoxicity with
Absorption
  K^+, and K^+ transport along nephron, 107
  Na^+ delivery and, and net K^+ transport in CCD, 107-108
AC, *see* Abdominal circumference, fetal
ACE (angiotensin-converting enzyme) inhibitors, 135, 143
Acid-base homeostasis, neonatal, 97-102
  disturbances of, 100-101
  inherited acidification defects and, 101
  maturation of acid excretion process and, 98-100
  mechanisms of, 97-98
Acid excretion process, maturation of, neonatal acid-base homeostasis and, 98-100
Acidification defects, inherited, neonatal acid-base balance and, 101
Acute bilirubin encephalopathy (ABE), neonatal
  clinical signs of, 322-323
  as eligibility criterion for kernicterus, 320
  see also Bilirubin-induced neurotoxicity in preterm infants; Kernicterus, neonatal
Acute hemolytic jaundice (favism) in G6PD-associated neonatal hyperbilirubinemia and, 357-359
Acute renal failure, neonatal, 112-123
  etiology of, *see* Etiology of neonatal acute renal failure
  incidence and epidemiology of, 113-114
  management of, *see* Therapy and management of neonatal acute renal failure
  outcome and prognosis of, 123
Acute tubular necrosis (ATN)/vasomotor nephropathy, neonatal acute renal failure and, 113, 115-116
Acyclovir, 344
Adenomatoid malformation, *see* Congenital cystic adenomatoid malformation
Adenosine
  and PC of developing brain, 390
  in PWMI, 410
  role of, in neonatal apnea, 276-277
Adenosine monophosphate, cyclic, axon growth and intracellular signaling by, 375
Adenosine triphosphate (ATP)-sensitive K^+ channels, role of, in PC of developing brain, 391
Adenosinergic agents, 422
Adjusted birth weight, customized, 36-37
Adjusted fetal growth standards, individually, 33
Adolescents, prematurely born, with and without neonatal PIVH, school performance of, 295-303
α (alpha)-Adrenergic receptors, 145-146
α1 (alpha1)-Adrenergic receptors, 144
α2 (alpha2)-Adrenergic receptors, 144
β (beta)-Adrenergic blockers, 144
β (beta)-Adrenergic receptors, 135, 144-146
Adult diseases, *see* Later adult diseases, relationship between fetal growth disorders and; Maternal disease
African American neonates, G6PD in, 361-362
AGA (average-for-gestational age) infants, *see* 5 years of age, outcome at, of SGA or AGA born infants at less than 28 weeks of gestation
Age-related changes in neonatal blood pressure, cardiac output, and vascular reactivity and sensitivity to catecholamines, 145
Airway, expression of antimicrobial peptides in, in early life, 307
Alagille syndrome with neonatal cholestasis, 355
Alpha (α)-adrenergic receptors, 145-146
Alpha (α)$_1$-antitrypsin (α_1AT) deficiency, neonatal cholestasis and, 354
Alpha-defensins, *see* Antimicrobial peptides in early human life
Alpha1 (α1)-adrenergic receptors, 144
Alpha2 (α2)-adrenergic receptors, 144
Amino acid(s) for abnormal uterine blood flow, 74
Amino acid antagonists, excitatory, neuroprotective therapies for against secondary brain injury in term infants with, 421-422
γ (gamma)-Aminobutyric acid (GABA), role of, in neonatal apnea, 273-277
  in hypoxic respiratory depression, 274-276
  induced by laryngeal stimulation, 276
  as mediator of adenosine-induced respiratory inhibition, 277
  in modulation of hypercapnic responses, 273-274
  in respiratory control, 273
Aminoglycosides, 116-117, 344
Aminophylline, 343, 344
Amniotic fluid volume
  assessment of, in fetal well-being determination, 14-15, 17
  uteroplacental insufficiency and, 70-71
Amphotericin B, 116
Ampicillin, 227, 343, 344
Angiotensin-converting enzyme (ACE) inhibitors, 135, 143
Anion transport polypeptides, organic, 134
Anion transporter family, organic, 133-134
Anorectal malformation, laparoscopy-assisted anorectal pull-through for, 219-220
Anorectal pull-through, laparoscopy-assisted, for anorectal malformations, 219-220
Antenatal conditions and interventions, *see* Fetoscopy for congenital anomalies *and entries beginning with terms*: Fetal, Intrauterine, In utero
Antibiotics
  neonatal acute renal failure due to, 116-117
  for NEC, 227, 237
  see also specific antibiotics
Antimicrobial peptides in early human life, 304-311
  characterized, 304-305
  expression of, 305-308
  function of, *see* Function of antimicrobial peptides in early life
  mechanisms of action of, 305
α (alpha)$_1$-Antitrypsin (α_1AT) deficiency, neonatal cholestasis and, 354
Anus, *see* Imperforate anus
Apical drug transport system, 134
Apnea, neonatal
  in bilirubin-induced neurotoxicity, 344-345
  see also Apnea, neonatal, role of inhibitory neurotransmitters in
Apnea, neonatal, role of inhibitory neurotransmitters in, 273-278
  of adenosine, 276-277
  clinical applications of findings on, 277-278
  of GABA, *see* γ-Aminobutyric acid, role of, in neonatal apnea
Apoptosis, *see* Hypoxia, perinatal, in developing brain, apoptosis and
Appetite, fetal, early nutrition, adult obesity and, 81-83
L-Arginine, 230
Arterial Doppler ultrasound of IUGR fetus, 12, 14-15, 67, 69-74, 76
Arterial perfusion syndrome, twin reversed, fetal surgery for, 201-202
Ascending cholangitis, as complication of Kasai hepatoportoenterostomy, 353-354
Ascending limb, thick, neonatal renal sodium transport by, 94-95
Asphyxia, *see* Perinatal asphyxia, effects of
Aspirin, 74
Asymmetric intrauterine growth restriction (IUGR), diagnosis of, 12-13
ATN (acute tubular necrosis)/vasomotor nephropathy, acute, neonatal acute renal failure and, 113, 115-116
ATP (adenosine triphosphate)-sensitive K^+ channels, role of, in PC of developing brain, 391
Atresia, neonatal
  biliary, with neonatal cholestasis, 353-354
  duodenal, MIS of, 215
  esophageal, *see* Esophageal atresia and tracheoesophageal fistula, neonatal
At-risk fetus for IUGR, 71-74
  antenatal surveillance of high-risk fetus, 73-74
  assessment of, 11-13
  identification of, 71-73
Auditory brainstem evoked response (ABR), measurement of bilirubin-induced neurotoxicity with, 340-347
  of auditory dysfunction, *see* Auditory dysfunction, bilirubin-induced, in preterm infants, ABR measurement of
  of auditory dys-synchrony, 345-346
  of sensory hearing loss, 346

Auditory dys-synchrony, bilirubin-induced, in preterm infants, ABR measurement of, 345-346
Auditory dysfunction, bilirubin-induced neurotoxicity, in preterm infants, ABR measurement of, 341-345
  apnea and, 344-345
  bilirubin-albumin binding variables and, 342-343
  bilirubin displacers and, 343-344
Average-for-gestational age infants, *see* 5 years of age, outcome at, of SGA or AGA born infants at less than 28 weeks of gestation
Axon growth in postnatal CNS, 371-378
  CNS myelin-derived inhibitors and, 371-373
  coreceptors involved in, 374-375
  and intracellular signaling by Rho, cAMP, PKA, and PKC, 375
  Nogo receptor and, 373-374
  and suppression of oligodendrocyte Nogo-A expression in response to hypoxia, 375-376

Barker hypothesis of relation between birth weight and later risk of maternal disease, 47-48
Basolateral drug transporters, 133-134
Bax, cerebral cortical, chronic neonatal hypoxia effects on level of, 383
Bcl, cerebral cortical, chronic neonatal hypoxia effects on level of, 383
Bedside surgical procedures in critically ill neonates
  major, preparation for, 237-239
  see also Common bedside surgical procedure(s) in critically ill neonates
Behavior, perinatal asphyxia effects on, 253-254
Beta (β)-adrenergic blockers, 144
Beta (β)-adrenergic receptors, 135, 144-146
Beta-defensins, *see* Antimicrobial peptides in early human life
Beta (β) human chorionic gonadotropin, *see* Free β human chorionic gonadotropin
Betamethasone, 178-179
Bifidobacterium infantis, 230
Biliary atresia with neonatal cholestasis, 353-354
Bilirubin-albumin binding measurements in neonatal jaundice, 334-339
  basics of, 334-335
  in bilirubin-induced neurotoxicity, 342-343
  evidence supporting use of, 336-337
  ignoring issue of, 335-336
  strategies validating, 337-338
Bilirubin clearance, diminished, in G6PD-associated neonatal hyperbilirubinemia, 360-361
Bilirubin displacers in neonatal bilirubin-induced neurotoxicity, 343-344
Bilirubin-induced neurological dysfunction, *see* Acute bilirubin encephalopathy, neonatal; Kernicterus, neonatal
Bilirubin-induced neurotoxicity in preterm infants, 340-347
  ABR measurement of, *see* Auditory brainstem evoked response, measurement of bilirubin-induced neurotoxicity with
  bilirubin-induced auditory dys-synchrony as, 345-346
  bilirubin-induced hearing loss as, 346
BIND (bilirubin-induced neurological dysfunction), *see* Acute bilirubin encephalopathy, neonatal; Kernicterus, neonatal
Bioartificial liver, development of, with tissue-engineering techniques, 169
Biochemical analysis of first trimester placental function, 44-47
Biology
  cellular, of PC, 390-392
  photobiology of bilirubin, 327
  see also Developmental biology; Molecular mechanisms underlying congenital anomalies; Genetics
Biophysical profile (BPP), fetal
  fetal well-being and, 14
  uteroplacental insufficiency and, 70-71, 76
Biopsy, liver, for neonatal cholestasis, 351
Biparietal diameter (BPD), fetal, 37, 72
  IUGR and, 72
  as measure of early growth, 43
  ultrasound assessment of, 3, 4, 6, 7, 9
Birth defects, *see* Neonatal surgery for congenital anomalies *and specific congenital anomalies*
Birth weight, 41-43
  CRL and, 42-43
  customized adjusted, 36-37
  first trimester fetal growth impairment and, 41-43
  later adult diseases and, 82, 84
  long-term neurological sequelae and, 54
  relationship between later risk of maternal disease and, 47-49
  term, in utero weight curve predicting, 34
  see also Macrosomia; Small-for-gestational age fetus
Bladder surgery, neonatal urinary, tissue-engineering techniques used in, 167
Blood flow
  cerebral, PC effects on, 392
  placental, *see* Placental vascular insufficiency, IUGR and
Blood pressure, *see* Blood pressure, neonatal; Hypertension; Hypotension
Blood pressure (BP), neonatal, 141-148
  in healthy full-term infants, 142-143
  regulation of, 142
  see also Blood pressure disorder(s), neonatal
Blood pressure (BP) disorder(s), neonatal, 143-146
  role of inotropes and inotrope receptors in, 144-146
  systemic hypertension as, 143-144
  systemic hypotension as, 144
Blue high-intensity gallium nitride light-emitting diodes (LEDs) used in phototherapy, 331
"Blue hue" effect of phototherapy, 331
Body weight
  effects of chronic neonatal hypoxia on brain and, 381-382
  see also Birth weight
BP, *see* Blood pressure, neonatal
BPD, *see* Biparietal diameter, fetal
BPP, *see* Biophysical profile, fetal
Brain, *see* Brain injury, perinatal; Corpus callosum; Perinatal asphyxia, effects of *and entries beginning with element*: Neur-
Brain injury, perinatal
  introduction to, 369-370
  see also Axon growth in postnatal CNS; Hypoxia, perinatal, effects of, on developing brain; Hypoxic-ischemic brain injury in term infants; Imaging of perinatal brain injury in preterm infants; Nonhuman primate models of neonatal brain injury; Periventricular white matter injury in preterm infants; Preconditioning, developing brain and; Preterm birth, cost-benefit analysis of neuroprotective therapies for; Preterm infants, brain injury in; Term infants, brain injury in
Brain protection, *see* Neuroprotective therapies
Brain weight, effects of chronic neonatal hypoxia on body and, 381-382
Breathing, neonatal, *see* Respiratory control, neonatal
Bronchopulmonary sequestration, fetal surgery for, 204-206
Bulking agents, engineered tissue used as, 167

Caffeine, 225
Calcium carbonate, 119
Calcium channel blockers, 422
Calcium gluconate, 118
cAMP (cyclic adenosine monophosphate), axon growth in postnatal brain and intracellular signaling by, 375
Cancer, later adult, relationship between fetal growth disorders and, 81, 85-87
  IGF-1, hypothalamo-pituitary axis and, 86-87
  indices of, 86
  obesity and, 85-87
  type 2 diabetes and, 86
Captopril, 143
Carbenicillin, 343, 344
Carbon monoxide (CO) production
  phototherapy and, 331-332
  studies of, in evaluation of hemolysis in G6PD, 360
Cardiac output, age-related changes in neonatal blood pressure, vascular sensitivity and reactivity to catecholamines and, 145

Cardiothoracic surgery, neonatal, tissue-engineering techniques used in, 165-167
Cardiotocography (CTG; nonstress test), fetal, 14, 63, 73, 76
L-Carnitine, 230
Caspases, role of, in PC of developing brain, 391
Catch-up growth by IUGR infants, later adult diseases and, 83-86
  cancer and, 85-86
  coronary artery disease and hypertension and, 84
  obesity and, 83
Catecholamines, age-related changes in cardiac output, neonatal blood pressure, and vascular sensitivity and reactivity to, 145
Cathelicidin, *see* Antimicrobial peptides in early human life
CC (corpus callosum), motor performance and size of, in preterm infants, 279-287
CCAM, *see* Congenital cystic adenomatoid malformation
CCD (cortical collecting duct), renal, luminal and peritubular factors in regulation of net K^+ transport in, 107-109
CDH, *see* Congenital diaphragmatic hernia
Cefazolin, 343, 344
Cefotan, 343, 344
Ceftriaxone, 343, 344
Cell death, *see* Hypoxia, perinatal, in developing brain, apoptosis and
Cell number, cerebral cortical, long-term effects of chronic neonatal hypoxia on, 379-388
Cellular biology of PC, 390-392
Central nervous system, *see* Axon growth in postnatal CNS; Brain injury, perinatal; Corpus callosum; Perinatal asphyxia, effects of *and entries beginning with element:* Neur-
Cerebral blood flow, PC effects on, 392
Cerebral cortex, chronic neonatal hypoxia and
  hypoxia effects of Bcl and Bax levels in, 383
  hypoxia and long-term decrease volume of, and cell number in, 379-388
Cerebral infarction, brain injury in term infants due to, 417
Chemical brain protection analogous to PC, 393
Chemical mediators of PWMI in preterm infants, 408-409
Chemoprevention of neonatal hyperbilirubinemia, 365-368
  clinical studies of, 366
  of nonspecific hyperbilirubinemia, 366-367
  of severe hyperbilirubinemia due to increased hemolysis, 367
Chemoreceptors, peripheral, destabilization of neonatal breathing and activity of, 264-272
Cholangiography, endoscopic magnetic resonance, and endoscopic retrograde, of neonatal cholestasis, 351
Cholangitis, ascending, as complication of Kasai hepatoportoenterostomy, 353-354
Cholestasis, neonatal, 348-355
  Alagille syndrome with, 355
  α_1-antitrypsin deficiency and, 354
  biliary atresia with, 353-354
  classification of, 348-349
  clinical presentation of, 349
  evaluation of, *see* Diagnosis and evaluation of neonatal cholestasis
  idiopathic hepatitis with, 354
  pathophysiology of, 348
  in preterm infants, 354
  progressive familial intrahepatic, 354-355
  therapy and management of, *see* Therapy and management of neonatal cholestasis
Cholestyramine, 352
Chondroitin sulfate proteoglycans (CSGPs), axon growth and, 373
Chorionic gonadotropin, *see* Free β human chorionic gonadotropin
Chromium, 366
Chronic neonatal hypoxia in developing brain, long-term decrease in cerebral cortical volume and cell number due to, 379-388
Circulatory findings on uteroplacental vascular insufficiency, 69-70
Classification
  of neonatal cholestasis, 348-349
  of stillbirths, 38
Clindamycin, 227
Clinical applications
  of customized fetal growth standards, 37-39
  of findings on neonatal apnea, 277-278
Clinical manifestations
  of brain injury in term infants, 418-419
  of G6PD, 358-359
  of neonatal ABE, 322-323
  of neonatal cholestasis, 349
Closure, bedside, of abdominal wall for gastroschisis in critically ill neonates, 236
CNS (central nervous system), *see* Axon growth in postnatal CNS; Brain injury, perinatal; Corpus callosum; Perinatal asphyxia, effects on *and entries beginning with element:* Neur-
CO, *see* Carbon monoxide production
Cognitive function
  perinatal asphyxia effects on, 253-254
  of prematurely born adolescents with and without neonatal PIVH, school performance and, 295-303
Collecting duct, cortical, luminal and peritubular factors in regulation of net neonatal K^+ transport in, 107-109
Colony stimulating factor, recombinant human granulocyte, 230
Common bedside surgical procedure(s) in critically ill neonates, 235-237
  ECMO, peritoneal drainage, and abdominal wall closure for gastroschisis as, 236
  laparotomy as, 237
  PDA ligation as, 235-236
  venous access installation as, 235
Complications of Kasai hepatoportoenterostomy, 353-354
Computed tomography (CT) of perinatal brain injury in preterm infants, 435-436
Congenital anomalies, *see* Neonatal surgery for congenital anomalies *and specific congenital anomalies*
Congenital cystic adenomatoid malformation (CCAM)
  fetal surgery for, 204-206
  minimally invasive pulmonary resection for, 213-214
  molecular mechanisms underlying, 157-158
Congenital diaphragmatic hernia (CDH), 174-198
  clinical care of, *see* Therapy and management of CDH
  diagnosis of, *see* Diagnosis and evaluation, CDH
  genetics of, 175
  molecular mechanisms underlying, 154-155
  mortality due to, 175
  patient registries of, 177-178
  summary and conclusions on, 181-182, 194
  surgery for, *see* Congenital diaphragmatic hernia, surgery for
Congenital diaphragmatic hernia (CDH), neonatal surgery for
  delayed surgery for, 185-187
  lung transplantation, 193-194
  minimally invasive surgery, 214-215
Congenital diaphragmatic hernia (CDH), surgery for
  fetal surgery, 180-181, 203-204
  see also Congenital diaphragmatic hernia, neonatal surgery for
Congenital Diaphragmatic Hernia (CDH) registry, 177
Conjugated bilirubin profiles, serum, in G6PD-associated neonatal hyperbilirubinemia, 360
Contrast media, intravascular, neonatal acute renal failure due to, 116
Controversies on care of CDH, 178
Conventional fetal growth assessment, 23-24
Conventional magnetic resonance imaging (MRI) of perinatal brain injury in preterm infants, 436-437
Convoluted tubule, distal, neonatal sodium transport by, 94-95
Convulsions (seizures), and ongoing brain hemorrhage in term infants, 420
Coreceptors involved in postnatal axon growth, 374-375
Coronary artery disease, later adult, relationship between fetal growth disorders and, 81, 83-84
Corpus callosum (CC), motor performance and size, in preterm neonates, 279-287
Cortex, *see* Cerebral cortex, chronic neonatal hypoxia and; Renal cortical collecting duct

Cortical collecting duct (CCD), renal, luminal and peritubular factors in regulation of net neonatal K^+ transport in, 107-109
Corticosteroids, *see* Steroids
Cortisol, 178
Cost-benefit analysis of neuroprotective therapies, *see* Preterm birth, cost-benefit analysis of neuroprotective therapies for
Cranial ultrasound (CUS) of perinatal brain injury in preterm infants, 434-435
Critically ill neonates, surgery of, 234-239
  bedside procedures in, *see* Bedside surgical procedures in critically ill neonates
  transport of, for surgery, 234-235
CRL, *see* Crown rump length, fetal
Crown rump length (CRL), fetal
  as measure of early pregnancy growth, 41-43, 47
  in pregnancy dating, 3, 6
CSGPs (chondroitin sulfate proteoglycans), axon growth and, 373
CT (computed tomography) of perinatal brain injury in preterm infants, 435-436
CTG (cardiotocography; nonstress test), fetal, 14, 63, 73, 76
CUS (cranial ultrasound) of perinatal brain injury in preterm infants, 434-435
Customized adjusted birth weight, 36-37
Customized fetal growth standards, 33-40
  clinical application of, 37-39
  cut-off limits for, 37
  establishing, 33-34
  evidence for, 35-37
  GROW software and, 34-35
Cut-off limits for customized fetal growth standards, 37
Cyclic adenosine monophosphate (cAMP), axon growth in postnatal brain and intracellular signaling by, 375
Cyclosporine, 230
Cystic adenomatoid malformation, *see* Congenital cystic adenomatoid malformation
Cytokines, and PC of developing brain, 392

Dating of pregnancy with ultrasound, 3-4, 33, 52
DCT (distal convoluted tubule), neonatal sodium transport by, 94-95
Defenses, *see* Antimicrobial peptides in early human life
α- and β-Defensins, *see* Antimicrobial peptides in early human life
Delayed (secondary) brain injury in term infants, 418-422
  neuroprotective therapies to ameliorate, 420-422
Delivery (birth process)
  of IUGR fetus, 62-64, 74-75
  of large babies, 64-65
  neonatal Na^+ absorption and, and net K^+ transport in CCD, 107-108
Destabilization of neonatal breathing, activity of peripheral chemoreceptor activity and, 264-272
Developing brain, *see* Ontogeny, brain
Development
  General Developmental Index of SGA or AGA born infants at less than 28 weeks of gestation, 292
  see also Developmental biology; Growth; Ontogeny, brain
Developmental biology
  developmental changes and NO availability in fetal erythrocytes, 312-316
  impact of advances in, *see* Molecular mechanisms underlying congenital anomalies
Dexamethasone
  bilirubin-induced neurotoxicity and, 344
  NEC and, 225
  postnatal, as neuroprotective therapy in preterm birth, cost of, 448
Diabetes mellitus, later adult type 2, relationship between fetal growth disorders and, 81, 84-87
Diagnosis and evaluation
  of CDH, *see* Diagnosis and evaluation, CDH
  of G6PD, 362
  of NEC, 225-226
  of neonatal brain hemorrhage in term infants, 416
Diagnosis and evaluation (*Continued*)
  of neonatal cholestasis, *see* Diagnosis and evaluation of neonatal cholestasis
  see also Fetal diagnosis of congenital anomalies *and specific diagnostic techniques and conditions*
Diagnosis and evaluation, CDH
  fetal, 175-176, 178
  postpartum, 176
Diagnosis and evaluation of neonatal cholestasis
  and of associated biliary atresia, 353
  with laboratory investigations, 349-351
  with radiological investigations, liver biopsy, and duodenal aspirate analysis, 351
Diaphragm surgery, neonatal, tissue-engineering techniques used in, 169
Diaphragmatic eventration, neonatal MIS of, 214-215
Diaphragmatic hernia, *see* Congenital diaphragmatic hernia
Diazoxide, 144
Dicloxacillin, 343, 344
Dietary polyunsaturated fatty acids, 230
Diffuse magnetic resonance imaging (MRI) of perinatal brain injury in preterm infants, 437
Dipyridamole, 190
Direct fetal growth assessment with IGA, 24
Disability due to brain injury in preterm birth, cost of care for, 445
Discordant twins, fetal surgery for, 202
Disease states
  renal drug transporter expression in, 137
  see also Critically ill neonates, surgery of; Later adult diseases, relationship between fetal growth disorders and; Kernicterus in sick and preterm infants; Maternal disease *and specific conditions*
Distal convoluted tubule (DCT), neonatal sodium transport by, 94-95
Distribution of G6PD, 357-358
Diuretics, 136-137, 213
Dobutamine, 144, 344
Dopamine, 118, 145, 344
Dopamine receptors, 145, 146
Dopaminergic receptor polymorphisms, 135-136
Doppler ultrasound, fetal
  arterial and venous, of IUGR fetus, 12, 14-15, 67, 69-74, 76
  of early growth, 39, 47
  of first trimester placental function, 44-47
Drainage, *see* Peritoneal drainage
Drug receptors, renal, pharmacogenomics and, 133, 135-137
Drug resistance, multidrug resistance-associated protein family, 134
Drug therapy, *see* Pharmacotherapeutic agents
Drug transport, *see* Renal drug transporters, pharmacogenomics and
Ductus arteriosus, *see* Patent ductus arteriosus, minimally invasive ligation of
Duodenal aspirate analysis of neonatal cholestasis, 351
Duodenal atresia, neonatal, MIS of, 215
Duration of exposure to phototherapy, 329-330

EA and TEF, *see* Esophageal atresia and tracheoesophageal fistula, neonatal
Early fetal growth
  ultrasound assessment of, 41-43, 45, 46
  see also First trimester origins of fetal growth impairment
Early human life, *see* Antimicrobial peptides in early human life
Early nutrition, later adult diseases and, 82-87
  cancer, 86, 87
  coronary artery disease, 83
  hypertension, 83
  obesity, 82-83
  type 2 diabetes, 84, 85
ECMO, *see* Extracorporeal membrane oxygenation
Efficacy of phototherapy for neonatal hyperbilirubinemia, 327-328
Electrolyte status in neonatal acute renal failure, monitoring, 117
Eligibility criteria for kernicterus, 320
ELSO (Extracorporeal Life Support Organization) registry of CDH patients, 177-178

Enalapralat, 143
Enalapril, 143
Encephalopathy, *see* Acute bilirubin encephalopathy, neonatal
Endorectal pull-through, minimally invasive, for Hirschsprung's disease, 216-217
Endoscopic retrograde cholangiography (ERC) of neonatal cholestasis, 351
Endoscopic surgery, fetal, 199-200
Energy failure, as mechanism of hypoxic-ischemic brain injury, 426-429
Enterocolitis, *see* Necrotizing enterocolitis
Epidemiology
  of neonatal acute renal failure, 113-114
  see also specific conditions
Epidermal growth factor, 230
Epidural hemorrhage in term infants, brain injury due to, 416
ERC (endoscopic retrograde cholangiography) of neonatal cholestasis, 351
Erythrocytes, fetal, developmental changes in NO availability in, 312-316
Erythropoietin, 225, 230, 422
Esophageal atresia (EA) and tracheoesophageal fistula (TEF), neonatal
  MIS of, 213
  molecular mechanisms underlying, 155-157
  see also Esophageal surgery, neonatal
Esophageal surgery, neonatal
  minimally invasive, 213
  tissue-engineering techniques used in, 168-169
Estrogens, later adult cancer due to maternal exposure to, 86
ET, *see* Exchange transfusions, neonatal
Ethical issues in management of congenital anomalies, 240-245
  of fetally diagnosed anomalies, 243-244
  patient-pediatric surgeon relationship and, 240-243
  pediatric surgery research and, 244-245
Etiology of neonatal acute renal failure, 113-118
  nephrotoxic, 113, 116-117
  prerenal failure as, 114-115
  vascular insults as, 113, 117
  vasomotor nephropathy/ATN as, 113, 115-116
Evaluation, *see* Diagnosis and evaluation
Eventration, diaphragmatic, neonatal MIS of, 214-215
Exchange transfusions (ET), neonatal
  bilirubin-induced neurotoxicity and, 341
  for G6PD, 362, 363
  for cholestasis, 352-353
  for kernicterus, 334-337, 356
Excitatory amino acid antagonists, as neuroprotection against secondary brain injury in term infants with, 421-422
Excitotoxicity, energy failure and, as mechanisms of hypoxic-ischemic brain injury in term infants, 426-428
Excretion, *see* Renal excretion
Experimental models of neonatal brain injury
  of chronic neonatal hypoxia, 379-388
  of PC in developing brain, 390
  of PWMI, 409-410
  see also Nonhuman primate models of neonatal brain injury
Exposure to estrogens, later adult cancer and maternal, 86
Exposure to phototherapy
  duration of, 329-330
  surface area, 329
  of renal drug transporters, 137-138
Extracorporeal Life Support Organization (ELSO) registry of CDH patients, 177-178
Extracorporeal membrane oxygenation (ECMO)
  bedside, in critically ill neonates, 236
  for CDH, 178, 180

Familial intrahepatic cholestasis, neonatal progressive, 354-355
Fatty acids, dietary polyunsaturated, 230
Favism (acute hemolytic jaundice), G6PD-associated neonatal hyperbilirubinemia and, 357-359
Femur length (FL), fetal
  IGA and, 24
Femur length (FL), fetal (*Continued*)
  intrauterine weight and, 37
  IUGR and, 72
  pregnancy dating and, 3, 4
  ultrasound estimation of, 7, 9, 12-13
Fentanyl, 344
Fetal abdominal circumference, *see* Abdominal circumference, fetal
Fetal biophysical assessment, *see* Biophysical profile, fetal
Fetal biparietal diameter, *see* Biparietal diameter, fetal
Fetal cardiotocography (CTG; nonstress test), 14, 63, 73, 76
Fetal causes of IUGR, 11
Fetal crown rump length, *see* Crown rump length, fetal
Fetal diagnosis of congenital anomalies
  ethics of surgery and, 243-244
  see also Ultrasound, fetal
Fetal erythrocytes, developmental changes and NO availability in, 312-316
Fetal femur length, *see* Femur length, fetal
Fetal growth
  ultrasound estimation of, 7
  see also Fetal growth disorders
Fetal growth disorders
  introduction to, 1-2
  see also Customized fetal growth standards; Fetal growth potential, FGR, and pregnancy outcome; First trimester origins of fetal growth impairment; Individualized Growth Assessment; Intrauterine growth restriction; Later adult diseases, relationship between fetal growth disorders and; Macrosomia; Small-for-gestational age fetus; Ultrasound assessment of fetal growth
Fetal growth potential, FGR, and pregnancy outcome, 51-58
  growth potential versus population norms, 51-53
  long-term neurological sequelae, 54-56
  perinatal mortality and morbidity, 53-54
  prematurity, 56-57
Fetal growth restriction, *see* Fetal growth potential, FGR, and pregnancy outcome; Intrauterine growth restriction; Small-for-gestational age fetus
Fetal growth standards, *see* Individualized growth standards in IGA
Fetal head circumference, *see* Head circumference, fetal
Fetal liver measurement, 13
Fetal nutrition, *see* Early nutrition, later adult diseases and
Fetal occipito-frontal diameter (OFD), 4, 6
Fetal programming
  of appetite, later adult obesity and, 82-83
  defined, 48
Fetal renal measurement, 13
Fetal surgery, 199-211
  of CCAM, 204-206
  of CDH, 180-181, 203-204
  of myelomeningocele, 202-203
  of obstructive uropathy, 207-209
  of SCT, 206-207
  techniques of, 199-200; *see also* Fetoscopy for congenital anomalies
  of twin reversed arterial perfusion syndrome, 201-202
  of twin-twin transfusion syndrome, 200-201
  of twins, *see* Twin(s), fetal surgery of
Fetal surveillance of fetus at high risk for IUGR, 73-74
Fetal therapy
  of CDH, *see* Fetal therapy of CDH
  with glucocorticoids, NEC and, 225
  neuroprotective, with steroids in preterm birth, cost of, 446-447
  see also Fetal surgery
Fetal therapy of CDH, 178-181
  with steroids, 178-179, 206
  with surgery, 180-181, 203-204
Fetal weight
  in utero curve of, TOW and, 34
  ultrasound estimation of, 4-7
  see also Intrauterine growth restriction; Macrosomia
Fetal weight curve, in utero, TOW and, 34

Fetal weight percentile, ultrasound estimation of, 7-10
Fetal well-being, assessment of, 14-15
FETENDO (endoscopic fetal surgery), 199-200
Fetoscopy for congenital anomalies, 199-202
  CDH, 204
  discordant twin surgery, 202
  TTTS, 201
  twin reverse arterial perfusion, 201-202
FGR (fetal growth restriction), *see* Fetal growth potential, FGR, and pregnancy outcome; Intrauterine growth restriction
FβhCG, *see* Free β human chorionic gonadotropin
Fiberoptic systems used in phototherapy, 331
First trimester origins of fetal growth impairment, 41-50
  animal studies on, 47
  birth weight and, 41-43
  early assessment of, 41-42
  placental function and, *see* First trimester placental function
First trimester placental function, 43-47
  PAPP-A and free β human chorionic gonadotropin in, 44-47
  placental development and, 43-44
First trimester pregnancy, ultrasound dating of, 3
Fistula, *see* Esophageal atresia and tracheoesophageal fistula, neonatal
5 years of age, outcome at, of SGA or AGA born infants at less than 28 weeks of gestation, 288-294
  growth pattern, 290
  medical health, 290-291
  neurodevelopmental outcome, 291-292
  neurosensory outcome, 291
FL, *see* Femur length, fetal
Fluid balance management in neonatal acute renal failure, 117
Flunarizine, 422
Fluorescent tubes used in phototherapy, 330
Follow-up, *see* Long-term follow-up and outcome
Free β human chorionic gonadotropin (FβhCG)
  growth potential and, 54
  role of, in first trimester placental function, 44-47
Free radical inhibitors, oxygen, neuroprotection against secondary brain injury in term infants with, 421
Frequency of G6PD, 357-358
Full-term infants, *see* Term infants
Function
  G6PD, 357
  of renal drug transporters, 133-135
  see also Function of antimicrobial peptides in early life
Function of antimicrobial peptides in early life, 305-309
  multifunction character of antimicrobial peptides, to disease, 308-309
Furosemide, 343, 344

G protein-coupled receptor kinases, 145
GA, *see* Gestational age
GABA, *see* γ-Aminobutyric acid, role of, in neonatal apnea
Gamma aminobutyric acid, *see* γ-Aminobutyric acid, role of, in neonatal apnea
Gastrointestinal tract, expression of antimicrobial peptides in, in early life, 307-308
Gastroschisis, bedside abdominal wall closure for, in critically ill neonates, 236
Gene expression
  antimicrobial peptide, in early human life, 305-308
  protein, *see* Gene expression, protein
  renal drug transporter, in disease states, 137
Gene expression, protein
  PC and, 391-392
  perinatal asphyxia effects on, 252-253
General Developmental Index (GPI) of SGA or AGA born infants at less than 28 weeks of gestation, 291
Genetics
  of CDH, 175
  genetic variants of G6PD, 358
Genetics (*Continued*)
  see also Gene expression; Inheritance; Pharmacogenomics; Polymorphism(s)
Gentamicin, 227
Gestation related optimal weight (GROW) software, 35-36
Gestational age (GA)
  outcome at 5 years of age of SGA or AGA born infants at less than 28 weeks of gestation, 288-294
  see also Fetal growth disorders *and entries beginning with terms:* Preterm, Premature
Giant cell hepatitis (idiopathic hepatitis), neonatal, with cholestasis, 354
Gilbert's syndrome (UGT promoter polymorphism) in G6PD, 360-361
Glucocorticoids, *see* Steroids
Glucose, 118
Glucose-6-phosphate dehydrogenase (G6PD) deficiency, neonatal hyperbilirubinemia and, 356-364
  in African American neonates, 361-362
  clinical manifestations of, 358-359
  distribution and frequency of, 357-358
  genetic variants of G6PD and, 358
  G6PD function and, 357
  pathogenesis of, 359-361
  prevention and therapy of G6PD, 362-363
Glutamate, role of, in PC of developing brain, 390
Glycoprotein, axon growth in postnatal brain and
  myelin-derived, 373
  oligodendrocyte-myelin, 373
Gonadotropin, *see* Free β human chorionic gonadotropin
G6PD, *see* Glucose-6-phosphate dehydrogenase deficiency, neonatal hyperbilirubinemia and
GPI (General Developmental Index) of SGA or AGA born infants at less than 28 weeks of gestation, 291
GPRI (Growth Potential Realization Index), 23, 28-31
Gradual-onset hemolytic jaundice in G6PD-associated neonatal hyperbilirubinemia, 359
Granulocyte colony stimulating factor, recombinant human, 230
GROW (gestation related optimal weight) software, 34-35
Growth
  at 5 years of age of SGA or AGA born infants at less than 28 weeks of gestation, 290
  perfluorocarbon-induced pulmonary, in CDH, 192-193
  ultrasound estimation of, 7; *see also* Fetal growth disorders
Growth factors (and their receptors), role of, in congenital anomalies, 153
Growth Potential Realization Index (GPRI), fetal, 23, 28-31
Growth standards, fetal, *see* Individualized growth standards in IGA
Guidelines
  for CT use, 436
  for CUS use, 435
  for MRI use, 441
Gynecological surgery, neonatal, tissue-engineering techniques used in, 170

Halogen spotlights used in phototherapy, 330-331
HC, *see* Head circumference, fetal
HD, *see* Hirschsprung's disease
Head circumference (HC), fetal, 37, 72
  IGA of, 24, 26-28
  IUGR and, 72
  later adult diseases and, 81
  pregnancy dating and, 3, 4
  in ultrasound assessment, 6, 7, 9, 12, 13
Healthy infants
  full-term, blood pressure of, 142-143
  renal K^+ handling in, *see* Homeostasis, regulation of neonatal renal K^+
Hearing loss, bilirubin-induced sensory, ARB measurement of, 346
Heart disease, *see* Ischemic heart disease, relationship between fetal growth disorders and
Heat shock proteins, role of, in PC of developing brain, 391
Hematological indices of hemolysis in G6PD-associated hyperbilirubinemia, 359

Heme oxygenase inhibitors for neonatal hyperbilirubinemia, 365-368
Hemodialysis for neonatal acute renal failure, 120
Hemofiltration for neonatal acute renal failure, 120
Hemolysis
  chemotherapy of severe hyperbilirubinemia due to increased, 367
  neonatal acute renal failure and, 117
  role of, in G6PD-associated neonatal hyperbilirubinemia, 359-360
  see also Hemolytic jaundice in G6PD-associated neonatal hyperbilirubinemia
Hemolytic jaundice in G6PD-associated neonatal hyperbilirubinemia, 357-359
  acute, 357-359
  gradual-onset, 359
Hemorrhages, neonatal
  periventricular-intraventricular, school performance of prematurely born adolescents with and without, 295-303
  see also Hemorrhages, neonatal, in term infants, brain injury due to
Hemorrhages, neonatal, in term infants, brain injury due to
  diagnosis of, 416
  epidural, 416
  intracranial, 415, 417
  prognosis following, 417
  subarachnoid, 415-416
  subdural, 416
  treatment of, 416-417
Hepatitis, idiopathic neonatal, with cholestasis, 354
Hepatobiliary scintigraphy of neonatal cholestasis, 351
Hepcidin, *see* Antimicrobial peptides in early human life
Hernia
  neonatal inguinal, MIS of, 217
  see also Congenital diaphragmatic hernia
HFOV (high-frequency oscillation ventilation) for CDH, 180
HIF-1 (hypoxia-inducible factor 1), role of, in PC of developing brain, 390-391
High-frequency oscillation ventilation (HFOV) for CDH, 180
High risk
  for IUGR, antenatal surveillance of fetus at, 73-74
  see also High risk for brain injury
High risk for brain injury
  oxidant-mediated PWMI in preterm infants, 406, 407
  in term infants, 419-420
Hirschsprung's disease (HD)
  minimally invasive endorectal pull-through for, 216-217
  molecular mechanisms underlying, 159-161
Histatin, *see* Antimicrobial peptides in early human life
Histology of cerebral injury in premature baboons, 401
Homeostasis, *see* Acid-base homeostasis, neonatal; Homeostasis, regulation of neonatal renal K^+
Homeostasis, regulation of neonatal renal K^+, 103-111
  by redistribution, 105
  through renal excretion, *see* Homeostasis, regulation of neonatal renal K^+ through renal excretion
Homeostasis, regulation of neonatal renal K^+ through renal excretion, 105-109
  K^+ transport sites along nephron and, 106-107
  luminal and peritubular factors in regulation of net K^+ transport in CCD, 107-109
H-peptide renal drug cotransporters, 134-135
β Human chorionic gonadotropin, free, *see* Free β human chorionic gonadotropin
Human milk, expression and function of antimicrobial peptides in, 308
Humerus length, fetal, 72
Hyperbilirubinemia, *see* Neonatal jaundice
Hypercapnia, permissive, CDH therapy with, 187-188
Hypercapnic responses, neonatal, GABA modulating, 273-274
Hyperinsulinemic hypoglycemia of infancy, persistent, molecular mechanisms underlying, 157
Hypertension
  later adult, relationship between fetal growth disorders and, 81, 83-84
Hypertension (*Continued*)
  maternal, IUGR and, 11
  neonatal, *see* Hypertension, neonatal
Hypertension, neonatal
  portal, as complication of Kasai hepatoportoenterostomy, 354
  systemic, 143-144
Hypoglycemia of infancy, persistent hyperinsulinemic, molecular mechanisms underlying, 157
Hypotension, neonatal systemic, 144
Hypothalamo-pituitary axis, fetal growth disorders, later adult cancer and, 86-87
Hypothermia, neuroprotection against secondary brain injury in term infants with, 420-421
Hypoxia, perinatal, in developing brain, apoptosis and, 383-386
  apoptotic proteins and, 384-386
  effects of, on Bcl-2 and Bax levels in cerebral cortex, 383
  recovery from, 386
  see also Transient hypoxia in developing brain, apoptosis and neurogenesis after
Hypoxia, perinatal, effects of, on developing brain
  chronic, long-term decrease in cerebral cortex volume and cell number due to, 379-388
  suppression of oligodendrocyte Nogo-A expression in response to, 375-376
  see also Hypoxia, perinatal, in developing brain, apoptosis and
Hypoxia-inducible factor 1 (HIF-1), role of, in PC of developing brain, 390-391
Hypoxic-ischemic brain injury in term infants
  intrapartum, 417-419
  and in non-human primates, compared, 398-400
  see also Hypoxic-ischemic brain injury in term infants, mechanism(s) of
Hypoxic-ischemic brain injury in term infants, mechanism(s) of, 425-435
  characteristics of neonatal brain and, 425-426
  energy failure as, 426-429
  excitotoxicity as, 426-428
  inflammation as, 429-430
  oxidative stress as, 428-429
Hypoxic respiratory depression, neonatal, role of GABA in, 274-276

Ibuprofen, 343, 344
ICU (intensive care unit), neonatal, effects of, on preterm birth outcome, 445-446
Idiopathic hepatitis (giant cell hepatitis) with neonatal cholestasis, 354
IGA, *see* Individualized Growth Assessment
IGF-1, *see* Insulin-like growth factor-1
IHD, *see* Ischemic heart disease, relationship between fetal growth disorders and
Imaging of perinatal brain injury in preterm infants, 433-443
  with computed tomography, 435-436
  with cranial ultrasound, 434-435
  with magnetic resonance imaging, *see* Magnetic resonance imaging of perinatal brain injury in preterm infants
Immunity, *see* Antimicrobial peptides in early human life
Immunization, as means of brain protection, 393
Immunohistochemical effects of perinatal asphyxia, 250-252
Imperforate anus, molecular mechanisms underlying, 158-159
Incidence
  of neonatal acute renal failure, 113-114
  see also specific conditions
Individualized drug therapy, polygenic inheritance and pharmacogenomic basis for, 137
Individualized Growth Assessment (IGA), 23-32
  conventional and, 23-24
  detection of growth abnormalities with, in fetus and in neonate, 29-30
  Rossavik model of, *see* Rossavik model of IGA
Individualized growth standards in IGA, 27-29
  fetal, 27-28, 33
  neonatal, 28-29
  see also Customized fetal growth standards

Indomethacin
bilirubin-induced neurotoxicity and, 344
in fetal surgery, 199, 213, 225
neuroprotective, in preterm birth, cost of, 447-448
Infarction, cerebral, brain injury in term infants due to, 417
Infectious causes of NEC, 224
Inflammation, as mechanism of hypoxic-brain injury in term infants, 429-430
Inflammatory mediators
of brain injury in term infants, 418
in pathophysiology of NEC, 222-224
Inguinal hernia, neonatal, MIS of, 217
Inhaled nitric oxide (iNO) for CDH, 189-190
Inheritance
of acidification defects, neonatal acid-base balance and, 101
polygenic, and pharmacogenomic basis for individualized drug therapy, 137; *see also* Polymorphism(s)
see also Genetics
Inhibitory neurotransmitters, *see* Apnea, neonatal, role of inhibitory neurotransmitters in
Initial total bilirubin concentration (TBC), effects of, on efficacy of phototherapy, 329
Injury
bilirubin-induced neurological, *see* Kernicterus, neonatal
brain, *see* Brain injury, perinatal
due acute renal failure in neonates, therapy to decrease, 120-121
iNO (inhaled nitric oxide) for CDH, 189-190
Inotropes (and inotrope receptors), role of, in neonatal blood pressure, 144-146
Insulin, 118, 344
Insulin-like growth factor-1 (IGF-1)
fetal growth, later adult cancer and, 86-87
in perinatal brain injury, 422
Intake, K^+, and neonatal renal K^+ handling
neonatal K^+ transport along nephron, 108-109
output and, 104
Intensive care unit (ICU), neonatal, effects of, on preterm birth outcome, 445-446
Intestinal malrotation, neonatal, MIS of, 215-216
Intestinal surgery, neonatal, tissue-engineering techniques used in, 168
Intracellular signaling by Rho, cAMP, PKA, and PKC, and axon growth in postnatal CNS, 375
Intracellular renal drug handling, pharmacogenomics and, 134
Intracranial hemorrhages in term infants, brain injury due to, 415, 417
Intrahepatic cholestasis, neonatal progressive familial, 354-355
Intrapartum hypoxic-ischemic brain injury in term infants, 417-419
Intratracheal Pulmonary Ventilation (ITPV) for CDH, 188-189
Intrauterine growth restriction (IUGR), 10-15
assessment of, *see* Intrauterine growth restriction, assessment of
defined, 33, 42
delivery and, 62-64, 74-75
due to placental disease, *see* Intrauterine growth restriction due to placental disease
fetal growth potential and, 52-55
fetal and maternal causes of, 11
first trimester origins of, 42, 48, 49
later adult diseases and, 83
management of, 61-64
placental vascular insufficiency and, 68-69; *see also* Placental vascular insufficiency, IUGR and
risk factors for, 11-12
symmetric and asymmetric, 12-13
unexplained, 38
see also Fetal growth potential, FGR, and pregnancy outcome; Intrauterine growth restriction, assessment of
Intrauterine growth restriction (IUGR), assessment of
individualized assessment, 24-25
see also Intrauterine growth restriction, Rossavik growth model assessment of; Ultrasound assessment of IUGR
Intrauterine growth restriction (IUGR), assessment of (*Continued*)
Intrauterine growth restriction (IUGR), Rossavik growth model assessment of, 27-29
fetal, 27-28
neonatal, 28-29
Intrauterine growth restriction (IUGR) due to placental disease, 67-80
identification of fetuses at risk for, 71-73
placental vascular insufficiency and, 68-69; *see also* Uteroplacental insufficiency, IUGR due to
prenatal surveillance of, 73-74
timing of intervention for, 74-76
ultrasound of, 72
Intrauterine weight
normal, 37
see also Intrauterine growth restriction
Intravascular contrast media, neonatal acute renal failure and, 116
Intravascular volume expansion, abnormal uterine blood flow and, 74; *see also* Uteroplacental insufficiency, IUGR due to
Intraventricular-periventricular hemorrhage, neonatal, school performance of prematurely born adolescents with or without, 295-303
In utero weight curve, term weight prediction with, 34
In vitro hypoxia, transient, apoptosis and neurogenesis after, 258-260
In vivo hypoxia, transient, apoptosis and neurogenesis after, 260
Irradiance of phototherapy, 328-329
Ischemia
and reperfusion injury in pathophysiology of NEC, 222
see also Ischemic heart disease, relationship between fetal growth disorders and
Ischemic heart disease (IHD), relationship between fetal growth disorders and
later adult, 84
risk of maternal, 48, 49
Ischemic-hypoxic brain injury, *see* Hypoxic-ischemic brain injury in term infants
ITPV (Intratracheal Pulmonary Ventilation) for CDH, 188-189
IUGR, *see* Intrauterine growth restriction

Jaundice, *see* Neonatal jaundice

K^+ (potassium), *see* Adenosine triphosphate-sensitive K^+ channels; Homeostasis, regulation of neonatal renal K^+
Kasai hepatoportoenterostomy for neonatal biliary atresia, 353-354
Kernicterus, neonatal
bilirubin-aluminum binding and, 336-338
G6PD and, 356, 357, 360, 361
prevention of, 362-363
see also Kernicterus in sick and preterm infants
Kernicterus in sick and preterm infants, 319-325
clinical indices of, 322-323
definitions of, and eligibility criteria for, 320
onset of, 322-323
Pilot Kernicterus Registry of, 320
Kinases, G protein-coupled receptor, 145

LAARP (laparoscopy-assisted anorectal pull-through) for anorectal malformations, 219-220
Laboratory evaluation
of NEC, 225-226
of neonatal cholestasis, 349
routine, of neonatal ABE, 323
Lactobacillus acidophilus, 230
Laparoscopy, minimally invasive neonatal, for congenital anomalies, 215
minimally invasive LAARP for anorectal malformations, 218-219
Laparoscopy-assisted anorectal pull-through (LAARP) for anorectal malformations, 218-219
Laparotomy, bedside, in critically ill neonates, 237
Large-for-gestational age fetus, *see* Macrosomia
Laryngeal stimulation, role of GABA in neonatal apnea induced by, 276
Lasix, 118

Last menstrual period (LMP)
early pregnancy growth assessment and, 41-43
fetal growth potential based on, 52
unreliability of pregnancy dating on basis of, 3
Later adult diseases, relationship between fetal growth disorders and, 81-87
cancer, *see* Cancer, later adult, relationship between fetal growth disorders and
coronary artery disease and hypertension, 81, 83-84
obesity, 81-83, 85-87
type 2 diabetes, 81, 84-87
LEDs (light-emitting diodes), blue high-intensity gallium nitride, used in phototherapy, 331
Leukomacia, periventricular, in preterm infants, oligodendrocyte development and, 406-407
LGA (large-for-gestational age) fetus, *see* Macrosomia
Ligation, PDA, *see* Patent ductus arteriosus, minimally invasive ligation of
Light-emitting diodes (LEDs), blue high-intensity gallium nitride, used in phototherapy, 331
Light sources for phototherapy, 330-331
Lingo, as coreceptor involved in postnatal axon growth, 374-375
Lipopolysaccharide (LPS), and PC of developing brain, 392
Liquid ventilation for CDH, 178
with perfluorocarbons, 191-192
Liver biopsy for neonatal cholestasis, 351
Liver measurement, fetal, 13
Liver surgery, neonatal, tissue-engineering techniques used in, 169
LMP, *see* Last menstrual period
Long-term follow-up and outcome
of CDH, 181
neurological, of fetal growth restriction, 54-56
school performance of prematurely born adolescents with and without neonatal periventricular-intraventricular hemorrhage, 295-303
see also 5 years of age, outcome at, of SGA or AGA born infants at less than 28 weeks of gestation
Long-term neurological sequelae of fetal growth restriction, 54-56
LPS (lipopolysaccharide), and PC of developing brain, 392
Luminal factors in regulation of net K^+ transport in CCD, neonatal K^+ homeostasis regulation and, 107-109
Lungs, *see entries beginning with term*: Pulmonary

Macrosomia (large-for-gestational age fetus)
management of, 59-61, 64-65
risk factors for, and definition of, 15
see also Macrosomia, assessment of
Macrosomia (large-for-gestational age fetus), assessment of
IGA of, 24
with Rossavik growth model, 27-29
with ultrasound, 15-17
MAG (myelin-associated glycoprotein), as CNS myelin-derived inhibitor, 373
Magnesium/nitroglycerin, 199
Magnetic resonance cholangiography (MRC) of neonatal cholestasis, 351
Magnetic resonance imaging (MRI)
of neuronal death after intrapartum hypoxic-ischemic injury in term infants, 419
see also Magnetic resonance imaging of perinatal brain injury in preterm infants
Magnetic resonance imaging (MRI) of perinatal brain injury in preterm infants
conventional, 436-437
correlation of, with outcome, 438-441
diffuse, 437
guidelines for use of, 441
volumetric measurements with, 437-438
Major bedside surgical procedures in critically ill neonates, 237-239
Malrotation, neonatal intestinal, MIS of, 215-216
Manganese, 366
Mannitol, 117-118
Maternal cardiovascular risk, fetal growth disorders and, 48, 49
Maternal disease
birth weight and later risk of, 47-49
IUGR and, 11
see also specific conditions
Maternal exposure to estrogens, later adult cancer and, 86
Maternal ischemic heart disease (IHD), fetal growth disorders and, 48, 49
Maternal oxygen therapy for abnormal uterine blood flow, 74
MCTs (medium-chain triglycerides) for neonatal cholestasis, 352
MDR1/P-glycoprotein transporters, 134
Mechanical ventilation for CDH, 178-180
Mechanisms of action
of antimicrobial peptides in early life, 305
of PC in developing brain, 390-392
Medical health at 5 years of age of SGA or AGA born infants at less than 28 weeks of gestation, 290-291
Medical management
of NEC, 226-227
of neonatal acute renal failure, 117-119
see also Pharmacotherapeutic agents *and specific conditions*
Medium-chain triglycerides (MCTs) for neonatal cholestasis, 352
Methicillin, 343, 344
Methylxanthine, 344, 345
Microglia-induced periventricular white injury (PWMI), in preterm infants, 407-408
Milk, human, expression and function of antimicrobial peptides in, 308
Mineralocorticoids, role of, in neonatal K^+ transport along nephron, 109
Minimally invasive surgery, *see* Fetoscopy for congenital anomalies; Minimally invasive surgery, neonatal, for congenital anomalies
Minimally invasive surgery (MIS), neonatal, for congenital anomalies, 212-220
for CDH and diaphragmatic eventration, 214-215
for duodenal atresia, 215
for EA and TEF, 213
for inguinal hernia, 217
for intestinal malrotation, 215-216
laparoscopy, *see* Laparoscopy, minimally invasive neonatal, for congenital anomalies
PDA ligation, *see* Patent ductus arteriosus, minimally invasive ligation of
pull-through, *see* Pull-through, minimally invasive
for pulmonary resection of CCAM, 213-214
with thoracoscopy, 212-213
Minocycline, 422
MIS, *see* Fetoscopy for congenital anomalies; Minimally invasive surgery, neonatal, for congenital anomalies
Miscarriage (spontaneous abortion), fetal growth disorders and, 45, 48
Models, *see* Experimental models of neonatal brain injury
Molecular mechanisms underlying congenital anomalies, 152-163
CCAM, 157-158
CDH, 154-155
EA and TEF, 155-157
growth factors and their receptors in, 153
Hirschsprung's disease, 159-161
imperforate anus, 158-159
PPHI, 157
transcription factor in, 152
in zebrafish, 153-154
Monitoring of electrolyte status in neonatal acute renal failure, 117
Monosialoganglioside, 422
Monozygotic twins, fetal surgery for, 200
Morbidity, *see* Perinatal morbidity *and specific conditions*
Morphine, 344
Morphological effects of perinatal asphyxia, 250-252
Mortality
due to CDH, 175
perinatal, due to fetal growth restriction, 53-54
see also specific conditions
Motor performance, size of corpus callosum and, of preterm neonates, 279-287

Movement Assessment Battery for Children (ABC), CC size associated with results of, in preterm neonates, 282-283
Moxalactam, 343, 344
MRC (magnetic resonance cholangiography) of neonatal cholestasis, 351
MRI, *see* Magnetic resonance imaging
Multidrug resistance-associated protein (MRP) family, 134
Myelin-associated glycoprotein (MAG), axon growth postnatal and, 373
Myelin-derived inhibitors in CNS, axon growth in postnatal brain and, 371-373
Myelomeningocele, fetal surgery for, 202-203

Na^+ (sodium) transport, *see* Renal Na^+ transport, neonatal
Nafcillin, 343, 344
NEC, *see* Necrotizing enterocolitis
Necrotizing enterocolitis (NEC), 221-233
  diagnosis of, 225-226
  management of, *see* Therapy and management of NEC
  pathophysiology of, *see* Pathophysiology of NEC
  prognosis of, 229
Neomycin, 354
Neonatal apnea, *see* Apnea, neonatal
Neonatal breathing, *see* Respiratory control, neonatal
Neonatal growth disorders, assessment of, with Rossavik model, 28-30
  IUGR, 29-30
  macrosomia, 30
Neonatal growth standards, individualized, 28-29
Neonatal hypoxia, *see* Hypoxia, perinatal, effects of, on developing brain
Neonatal intensive care unit (NICU), effects of, on preterm birth outcome, 445-446
Neonatal jaundice
  introduction to, 317-318
  see also Bilirubin-albumin binding measurements in neonatal jaundice; Bilirubin-induced neurotoxicity in preterm infants; Chemoprevention of neonatal hyperbilirubinemia; Cholestasis, neonatal; Glucose-6-phosphate dehydrogenase deficiency, neonatal hyperbilirubinemia and; Kernicterus in sick and preterm infants; Phototherapy of neonatal hyperbilirubinemia
Neonatal periventricular/intraventricular hemorrhage (PIVH), school performance of adolescents with or without, 295-303
Neonatal potassium handling, *see* Homeostasis, regulation of neonatal renal K^+
Neonatal renal disorders, *see* Renal disorder(s), neonatal
Neonatal respiratory control, *see* Respiratory control, neonatal
Neonatal sodium, *see* Renal Na^+ transport, neonatal
Neonatal surgery for congenital anomalies
  introduction to, 149-151
  see also Congenital diaphragmatic hernia; Critically ill neonates, surgery of; Ethical issues in management of congenital anomalies; Fetal surgery; Minimally invasive surgery, neonatal, for congenital anomalies; Molecular mechanisms underlying congenital anomalies; Necrotizing enterocolitis; Tissue-engineering applications in neonatal surgery for congenital anomalies
Neonates, *see* Preterm neonates *and entries beginning with terms:* Neonatal Perinatal
Nephron, and K^+ transport and homeostasis and, 106-109
  K^+ transport sites along, 106-107
Nephropathy, *see specific renal conditions*
Nephrotoxic acute renal failure, neonatal, 113, 116-117
Nerve growth factor (NGF), 422
Net K^+ (potassium) transport in CCD, neonatal renal Na^+ absorption and, 107-108
Neurodevelopmental outcome
  at 5 years of age of SGA or AGA born infants at less than 28 weeks of gestation, 291-292
  preterm birth and, 444-446; *see also* Neurodevelopmental outcome of preterm infants with perinatal brain injury
Neurodevelopmental outcome of preterm infants with perinatal brain injury
  CT findings correlated with 436
  CUS findings correlated with, 434-435
  MRI findings correlated with, 438-441
Neurogenesis, *see* Ontogeny, brain
Neurological dysfunction, *see* Acute bilirubin encephalopathy, neonatal; Bilirubin-induced neurotoxicity in preterm infants; Brain injury, perinatal; Kernicterus, neonatal
Neurological sequelae, long-term, of fetal growth disorders, 54-56
Neurology, perinatal asphyxia effects on, 253-254
Neuronal death following intrapartum hypoxic-ischemic brain injury in term infants, 418, 419
Neuronal periventricular white matter injury (PWMI), perinatal, 408
Neuroprotective therapies
  analogies of, to PC, 393
  see also Neuroprotective therapies of brain injury in term infants; Preterm birth, cost-benefit analysis of neuroprotective therapies for
Neuroprotective therapies of brain injury in term infants, 419-422
  with secondary brain injury, 420-422
Neurosensory outcome at 5 years of age of SGA or AGA born infants at less than 28 weeks of gestation, 291
Neurotoxicity, *see* Bilirubin-induced neurotoxicity in preterm infants
Neurotransmitters, *see* Apnea, neonatal, role of inhibitory neurotransmitters in
Neutrophils, expression and function of antimicrobial peptides in, 306
NGF (nerve growth factor), 422
NgR (Nogo receptor), postnatal axon growth and, 373-374
Nicardipine, 143
NICU (neonatal intensive care unit), effects of, on preterm birth outcome, 445-446
Nifedipine, 144
Nitric oxide (NO)
  developmental changes and availability of, in fetal erythrocytes, 312-316
  inhaled, for CDH, 189-190
  preventing formation of, as neuroprotection against secondary brain injury in term infants, 422
  role of, in PC of developing brain, 390
Nitroglycerin/magnesium, 199
Nitroprusside (sodium nitroprusside), 144
NO, *see* Nitric oxide
Nogo, as CNS myelin-derived inhibitor, 372-373
Nogo-A expression, suppression of oligodendrocyte, in response to hypoxia, postnatal axon growth and, 375-376
Nogo receptor (NgR), postnatal axon growth and, 373-374
Nonhuman primate models of neonatal brain injury, 396-404
  disadvantages of, 402
  ontogeny of primate brain in, 397-398
  and in preterm infants, 400-401
  primate taxonomy, 396-397
  and in term infants with hypoxic-ischemic injury, compared, 398-400
Nonspecific hyperbilirubinemia, neonatal, chemoprevention of, 366-367
Nonsteroidal anti-inflammatory drugs, 116, 117, 343, 344
Nonstress test (cardiotocography), fetal, 14, 63, 73, 76
Normal intrauterine weight, 37
Nutrition, *see* Early nutrition, later adult diseases and; Nutritional management
Nutritional management
  of NEC, 230
  of neonatal acute renal failure, 117, 119
  of neonatal Alagille syndrome, 355
  of neonatal cholestasis, 352
  of neonatal idiopathic hepatitis and α_1-antitrypsin deficiency, 354

Obesity, later adult, relationship between fetal growth disorders and, 81-83, 85-87
Obstructive nephropathy, perinatal, 124-131
Obstructive uropathy, fetal surgery for, 207-209
Occipito-frontal diameter (OFD), fetal, 4, 6

Oligodendrocyte(s) in preterm infants
development of, and PVL, 406-407
suppression of Nogo-A expression in, as response to hypoxia, axon growth and, 375-376
Oligodendrocyte-myelin glycoprotein (OMGP), axon growth in postnatal brain and, 373
Ongoing brain injury in term infants due to seizures, 420
Onset
gradual, of hemolytic jaundice in G6PD-associated neonatal hyperbilirubinemia, 359
of kernicterus in sick and preterm infants, 322-323
Ontogeny, brain
in nonhuman primates, 397-398
see also Axon growth in postnatal CNS; Hypoxia, perinatal, effects of, on developing brain; Preconditioning in developing brain; Transient hypoxia in developing brain, apoptosis and neurogenesis after
Organic anion transport polypeptides (OATP), 134
Orthopedic surgery, neonatal, tissue-engineering techniques used in, 170
Outcome
long-term, *see* Long-term follow-up and outcome
of neonatal acute renal failure, 123
neurodevelopmental, *see* Neurodevelopmental outcome
pregnancy, *see* Fetal growth potential, FGR, and pregnancy outcome
see also Mortality; Prognosis; Survival
Output, neonatal K^+, and renal K^+ handling, 104
Oxacillin, 343, 344
Oxidative stress
energy failure and, as mechanisms of hypoxic-ischemic brain injury in term infants, 428-429
PWMI and, in preterm infants, 406, 407
Oxygen free radical inhibitors, neuroprotection against secondary brain injury in term infants with, 421
Oxygen therapy, maternal, for abnormal uterine blood flow, 74

P75, as coreceptor involved in postnatal axon growth, 374-375
PA, *see* Perinatal asphyxia, effects of
Papaverine, 343, 344
PAPP-A (pregnancy associated plasma protein A), role of, in first trimester placental function, 44-47
Partial liquid ventilation (PLV) with perfluorocarbons for CDH, 191-192
Patent ductus arteriosus (PDA), minimally invasive ligation of, 213
bedside, in critically ill neonates, 235-236
Pathogenesis
of apnea, *see* Apnea, neonatal
of brain injury in term infants, 417-418
of neonatal G6PD, 359-361
Pathology
PWMI, 405-406
see also specific conditions
Pathology-free customized growth standards, 33-34
Pathophysiology
of neonatal cholestasis, 348
see also Pathophysiology of NEC
Pathophysiology of NEC, 222-225
infectious causes, 224
inflammatory mediators in, 222-224
ischemia and reperfusion injury in, 222
pharmacotherapeutic agents in, 225
physiology of premature gut and, 224
Patient-pediatric surgeon relationship, and ethics of congenital anomaly surgery, 240-243
Patient registry(ies)
of CDH, 177-178
Pilot Kernicterus Registry, 320
PC, *see* Preconditioning in developing brain
PDA, *see* Patent ductus arteriosus, minimally invasive ligation of
Pediatric surgeon-patient relationship, ethics of congenital anomaly surgery and, 243-244
Pediatric surgery research, ethics of, 244-245
Penicillamine for neonatal hyperbilirubinemia, 365
Pentoxifylline, 230
PEPT1 (and PEPT2) drug cotransporters, 134-135
Peptides, *see* Antimicrobial peptides in early human life
Percent Deviation in fetal growth assessment, 23
relationship of GPRI and, to growth rates, 31
Perfluorocarbons for CDH, 191-193
liquid ventilation with, 191-193
lung growth induced with, 192-193
Perfusion syndrome, twin reversed arterial, fetal surgery for, 201-202
Perinatal asphyxia (PA), effects of, 249-256
on cognitive functions, behavior, and neurology, 253-254
morphological and immunohistochemical changes, 250-252
on protein expression, 252-253
Perinatal brain injury, *see* Brain injury, perinatal
Perinatal morbidity, fetal growth restriction and, 53-54; *see also specific conditions*
Perinatal mortality, fetal growth restriction and, 53-54
Perinatal obstructive nephropathy, 124-131
Peripheral chemoreceptors, destabilization of neonatal breathing and activity of, 264-272
Peritoneal dialysis for neonatal acute renal failure, 119
Peritoneal drainage
bedside, in critically ill neonates, 236
for NEC, 228
Peritubular factors in regulation of net K^+ transport in CCD, K^+ homeostasis regulation and, 107-109
Periventricular-intraventricular hemorrhage (PIVH), neonatal, school performance of prematurely born adolescents with and without, 295-303
Periventricular leukomacia (PVL), and oligodendrocyte development in preterm infants, 406-407
Periventricular white matter injury (PWMI) in preterm infants, 405-414
adenosine in, 410
chemical mediators of, 408-409
experimental models of, 409-410
high risk for, 406, 407
microglia-induced, 407-408
oligodendrocytes and, *see* Oligodendrocytes in preterm infants
oxidative stress and, 406, 407
pathology of, 405-406
perinatal neuronal, 408
Permissive hypercapnia, CDH therapy with, 187-188
Persistent hyperinsulinemic hypoglycemia of infancy (PPHI), molecular mechanisms underlying, 157
PFIC (progressive familial intrahepatic cholestasis), neonatal, 354-355
Pharmacogenomics, 132-140
defined, 132
promises and limitations of, 133
renal drug receptors and, 135-138
renal drug transporters and, *see* Renal drug transporters, pharmacogenomics and
Pharmacotherapeutic agents
role of, in pathophysiology of NEC, 225
see also Pharmacogenomics *and specific therapeutic agents*
Phenobarbital
bilirubin-induced neurotoxicity and, 344
in neonatal cholestasis, 351, 352
neuroprotective, in term infants, 420
Photobiology of bilirubin, 327
Phototherapy
of neonatal cholestasis, 352-353
to prevent bilirubin-induced auditory neurotoxicity, 345
see also Phototherapy of neonatal hyperbilirubinemia
Phototherapy of neonatal hyperbilirubinemia, 326-333
bilirubin-albumin binding and, 336
"blue hue" effect of, 331
carbon monoxide production and, 331-332

Phototherapy of neonatal hyperbilirubinemia, 326-333 (*Continued*)
due to G6PD, 356, 362
efficacy of, 327-328
exposure to, *see* Exposure to phototherapy
irradiance of, 328-329
light sources for, 330-331
photobiology of bilirubin and, 327
side effects of, 330
spectral qualities of, 328, 329
Physiology of premature gut, NEC and, 224
Pigmentation of skin, effects of, on efficacy of phototherapy for neonatal hyperbilirubinemia, 329
Pilot Kernicterus Registry, 320
PIVH (periventricular-intraventricular hemorrhage), neonatal, school performance of prematurely born adolescents with and without, 295-303
PKA (protein kinase A), axon growth in postnatal CNS and intracellular signaling by, 375
PKC (protein kinase C), axon growth in postnatal CNS and intracellular signaling by, 375
Placental disease, *see* Intrauterine growth restriction due to placental disease
Placental function, *see* First trimester placental function; Placental vascular insufficiency, IUGR and
Placental vascular insufficiency, IUGR and, 68-69
see also Uteroplacental insufficiency, IUGR due to
Plasma protein A, role of pregnancy associated, in first trimester placental function, 44-47
Plastic surgery, neonatal, tissue-engineering techniques used in, 170-171
Platelet-activating factor antagonists, 422
PLV (partial liquid ventilation) with perfluorocarbons for CDH, 191
Polygenic inheritance
and pharmacogenomic basis for individualized drug therapy, 137
see also Polymorphism(s)
Polymorphism(s), 135-137
dopaminergic receptor, 135-136
RAAS gene, pharmacogenomics and, 135-137
UGT promoter, in G6PD-associated neonatal hyperbilirubinemia, 360-361
Polypeptides, organic anion transport, 134
Polyunsaturated fatty acids, dietary, 230
Population norms, fetal growth potential versus, 51-53
Portal hypertension as complication of Kasai hepatoportoenterostomy, 354
Postnatal dexamethasone, as neuroprotective therapy in preterm birth, cost of, 448
Postnatal growth, *see* Catch-up growth by IUGR infants, later adult diseases and
Postpartum diagnosis of CDH, 176
Potassium, *see* Adenosine triphosphate-sensitive K^+ channels; Homeostasis, regulation of neonatal renal K^+
PPHI (persistent hyperinsulinemic hypoglycemia of infancy), molecular mechanisms underlying, 157
Preconditioning (PC) in developing brain, 389-395
brain protection analogies to, 393
cellular biology of, 390-392
defined, 389
Predischarge bilirubin testing for G6PD-induced neonatal hyperbilirubinemia, 362
Pregnancy associated plasma protein A (PAPP-A), role of, in first trimester placental function, 44-47
Pregnancy outcome, *see* Fetal growth potential, FGR, and pregnancy outcome *and specific outcomes; for example*: Stillbirths, fetal growth disorders and
Premature gut, NEC and physiology of, 224
Premature neonates, *see* Critically ill neonates, surgery of; Preterm delivery; Preterm infants
Prenatal conditions and interventions, *see* Fetoscopy for congenital anomalies *and entries beginning with terms*: Fetal, Intrauterine, In utero
Preparation for major surgical procedures in critically ill neonates, 237-239
Prerenal failure, neonatal, acute renal failure and, 114-115
Preterm birth
with and without PIVH and school performance of prematurely born adolescents, 295-303
see also Preterm birth, cost-benefit analysis of neuroprotective therapies in; Preterm infants
Preterm birth, cost-benefit analysis of neuroprotective therapies in, 444-450
antenatal steroid cost, 446-447
indomethacin cost, 447-448
neurodevelopmental outcome and, 444-446; *see also* Neurodevelopmental outcome of preterm infants with perinatal brain injury
in NICU, 445-446
postnatal dexamethasone cost, 448
risk of brain injury and, 445
surfactant cost, 447
Preterm delivery, growth restriction and, 56-57
Preterm infants
brain injury in, *see* Preterm infants, brain injury in
with cholestasis, 354
corpus callosum size and motor performance of, 279-287
with or without PIVH, school performance of adolescents born as, 295-303
see also Bilirubin-induced neurotoxicity in preterm infants; Critically ill neonates, surgery of; Imaging of perinatal brain injury in preterm infants; Kernicterus in sick and preterm infants; Periventricular white matter injury in preterm infants; Premature gut; Preterm birth; Preterm delivery
Preterm infants, brain injury in
imaging of, *see* Imaging of perinatal brain injury in preterm infants
nonhuman primate models compared with, 400-401
Preventive therapy
of bilirubin-induced auditory neurotoxicity, 345
of brain injury in term infants with phenobarbital, 420
of G6PD, 362-363
of NEC, 229-230
neuroprotective, *see* Neuroprotection therapies
see also Chemoprevention of neonatal hyperbilirubinemia
Primate models of neonatal brain injury, *see* Nonhuman primate models of neonatal brain injury
Prognosis
following cerebral hemorrhages, 417
of NEC, 229
of neonatal acute renal failure, 123
see also Outcome
Programming, fetal, *see* Fetal programming
Progressive familial intrahepatic cholestasis (PFIC), neonatal, 354-355
Promoter polymorphism, UGT, in G6PD, 360-361
Protein
apoptotic, in hypoxia, 384-386
see also Gene expression, protein *and specific proteins*
Protein A, pregnancy associated plasma, role of, in first trimester placental function, 44-47
Protein kinase A (PKA), axon growth in postnatal brain and intracellular signaling by, 375
Protein kinase C (PKC), axon growth in postnatal brain and intracellular signaling by, 375
Proteoglycans, chondroitin sulfate, axon growth in postnatal brain and, 373
Protocol, G6PD testing, 362
Proximal tubule, neonatal Na^+ transport by, 92-94
Pruritus in neonatal cholestasis, management of, 352
Pull-through, minimally invasive, 216-219
endorectal, for HD, 216-217
laparoscopy-assisted anorectal, for anorectal malformations, 218-219
Pulmonary growth, perfluorocarbon-induced neonatal, in CDH, 192-193
Pulmonary resection for CCAM, minimally invasive, 213-214
PVL (periventricular leukomacia), and oligodendrocyte development in preterm infants, 406-407
PWMI, *see* Periventricular white matter injury in preterm infants

RAAS (renin-angiotensin-aldosterone system) gene polymorphisms, pharmacogenomics and, 135-137
Radiography
of NEC, 226
of neonatal cholestasis, 351
see also specific radiographic procedures
Rapamycin, 230
Reactivity, vascular sensitivity and, to catecholamines, age-related changes in neonatal blood pressure, cardiac output and, 145
Recombinant human erythropoietin, 225, 230
Recombinant human granulocyte colony stimulating factor, 230
Reconstructive surgery, neonatal, *see* Tissue-engineering applications in neonatal surgery for congenital anomalies
Recovery
from effects of perinatal hypoxia, 386
from neonatal acute renal failure, therapy to promote, 120-121
Redistribution, K^+, renal K^+ balance regulation by, 105
Registries of CDH, 177-178
Renal cortical collecting duct (CCD), luminal and peritubular factors in net neonatal K^+ transport in, 107-109
Renal disorder(s), neonatal
introduction to, 89-90
see also Acid-base homeostasis, neonatal; Acute renal failure, neonatal; Blood pressure, neonatal; Homeostasis, regulation of neonatal renal K^+; Perinatal obstructive nephropathy; Pharmacogenomics; Renal Na^+ transport, neonatal
Renal drug receptors, pharmacogenomics and, 133, 135-137
Renal drug transporters, pharmacogenomics and
expression of, 137-138
function of, 133-135
Renal excretion
maturation of acid, acid-base balance and, 98-100
see also Homeostasis, regulation of neonatal renal K^+ through renal excretion
Renal failure, *see* Acute renal failure, neonatal
Renal Na^+ (sodium) transport, neonatal, 91-96
absorption and delivery of, and neonatal net K^+ transport in CCD, 107-108
by collecting duct, 95
by thick ascending limb, 94-95
tubular, *see* Tubular Na^+ transport, neonatal
Renal potassium handling, neonatal, *see* Homeostasis, regulation of neonatal renal K^+
Renal replacement therapy for neonatal acute renal failure, 119-120
Renal size, measurement of fetal, 13
Renin-angiotensin-aldosterone system (RAAS) gene polymorphisms, pharmacogenomics and, 135-137
Reperfusion injury, ischemia and, in NEC pathophysiology, 222
Reproductive history, fetal growth disorders and, 49
Research in pediatric surgery, ethics of, 244-245
Respiratory control, neonatal, 264-273
adenosine role in, 276-277
GABA role in, 273
peripheral chemoreceptor activity and destabilization of, 264-272
Respiratory depression, neonatal hypoxic, role of GABA in, 274-276
Respiratory inhibition, GABA as mediator of adenosine-induced, 277
Reversed arterial perfusion syndrome, twin, fetal surgery for, 201-202
Rhabdomyolysis, neonatal acute renal failure and, 117
Rho, axon growth in postnatal brain and intracellular signaling by, 375
Rifampin for neonatal cholestasis, 352
Risk and risk factor(s)
for brain injury, *see* High risk for brain injury
for later adult diseases, *see* Later adult diseases, relationship between fetal growth disorders and
for later maternal disease, birth weight as, 47-49
for macrosomia, 15-17
see also At-risk fetus for IUGR
Rossavik model of IGA, 25-27
components of, 25-26
Rossavik model of IGA, 25-27 (*Continued*)
individualized growth standards in, *see* Individualized growth standards in IGA
specifications of, for second trimester, 26-27
Routine laboratory evaluation of neonatal of ABE, 323

Sacrococcygeal teratoma (SCT), fetal surgery for, 206-207
SAH (subarachnoid hemorrhage) in term infants, brain injury due to, 415-416
School performance of prematurely born adolescents with and without neonatal PIVH, 295-303
Scintigraphy, hepatobiliary, of neonatal cholestasis, 351
Screening tests for G6PD, 362
SCT (sacrococcygeal teratoma), fetal surgery for, 206-207
SDH (subdural hemorrhage) in term infants, brain injury due to, 416
Second trimester pregnancy
Rossavik model specifications for, 26-27
ultrasound dating of, 3-4
Secondary brain injury, *see* Delayed brain injury in term infants
Secretion, neonatal K^+, and K^+ transport along nephron, 107
Seizures (convulsions), and ongoing brain injury in term infants, 420
Sensitivity, vascular reactivity and, age-related changes cardiac output, and neonatal blood pressure and, 135
Sensory hearing loss, bilirubin-induced, ARB measurement of, 346
Sequestration, bronchopulmonary, fetal surgery for, 204-206
Serial ultrasound
fetal weight percentile estimation with, 9-10
of IUGR, 13
Serum conjugated bilirubin profiles in G6PD-associated neonatal hyperbilirubinemia, 359
Severe hyperbilirubinemia
determination of, 322
neonatal, due to increased hemolysis, chemoprevention of, 367
SGA, *see* Small-for-gestational age fetus
Sick neonates, *see* Critically ill neonates, surgery of; Kernicterus in sick and preterm infants
Side effects of phototherapy, 330
Sites, neonatal K^+ transport, along nephron, renal K^+ homeostasis regulation and, 106-107
Skin
expression of antimicrobial peptides on, in early life, 306-307
thickness and pigmentation of, effects of, on efficacy of phototherapy of neonatal hyperbilirubinemia, 329
Small-for-gestational age (SGA) fetus
defined, 11
management of, 49-64
see also 5 years of age, outcome at, of SGA or AGA born infants at less than 28 weeks of gestation; Intrauterine growth restriction
Sodium, *see* Renal Na^+ transport, neonatal
Sodium bicarbonate, 118
Sodium citrate, 118
Sodium nitroprusside (nitroprusside), 144
Sodium transport, *see* Renal Na^+ transport, neonatal
Software, GROW, 34-35
Spectral qualities of phototherapy, 328, 329
Spontaneous abortion (miscarriage), fetal growth disorders and, 45, 48
Stannsoporfin (tin mesoporphyrin) for neonatal hyperbilirubinemia, 365-368
Steroids
for abnormal uterine blood flow, 74, 75
effects of, on neonatal blood pressure, 146
fetal, of CDH, 178-179, 206
maternal exposure to, and later adult cancer, 86
NEC and, 225
neuroprotective antenatal, in preterm birth, cost of, 446-447
Stillbirths, fetal growth disorders and, 37, 38, 59
due to placental disease, 75
fetal growth potential and, 45, 47, 53, 54
first trimester origins of growth disorders and, 45, 47

Stillbirths, fetal growth disorders and, 37, 38, 59 (*Continued*)
of IUGR fetus, 62-64, 69
unexplained, 38
Subarachnoid hemorrhage (SAH) in term infants, brain injury due to, 415-416
Subdural hemorrhage (SDH) in term infants, brain injury due to, 416
Sulfamethaxazole, 343, 344
Sulfisoxazole, 336, 343, 344
Supportive care of brain injury in term infants, 419
Surface area exposed to phototherapy, 329
Surfactant therapy
of CDH, 179
in neuroprotective therapy in preterm birth, cost of, 447
in pathophysiology of NEC, 225
Surgery, *see* Neonatal surgery for congenital anomalies; Renal replacement therapy *and specific procedures*
Survival, and preterm birth in NICU, 445-446
Symmetric intrauterine growth restriction (IUGR), 12-13
Systemic hypertension, neonatal, 143-144
Systemic hypotension, neonatal as, 144

Taxonomy of nonhuman primates, 396-397
TBC (total bilirubin concentration), effects of initial, on efficacy of phototherapy of neonatal hyperbilirubinemia, 329
TEF (tracheoesophageal fistula), *see* Esophageal atresia and tracheoesophageal fistula, neonatal
Teratoma, sacrococcygeal, fetal surgery for, 206-207
Terbutaline, 199-200
Term (full-term) infants
healthy, blood pressure of, 142-143
in utero weight curve predicting birth weight of, 34
see also Term infants, brain injury in
Term (full-term) infants, brain injury in, 415-424
clinical manifestations of, 418-419
delayed injury, *see* Delayed brain injury in term infants
due to cerebral infarction, 417
due to hemorrhages, *see* Hemorrhages, neonatal, in term infants, brain injury due to
with hypoxic-ischemic brain injury, *see* Hypoxic-ischemic brain injury in term infants
inflammatory mediators of, 418
neuroprotective therapies of, *see* Neuroprotective therapies of brain injury in term infants
pathogenesis of, 417-418
seizures and ongoing, 420
"Term optimal weight" (TOW), 33-35
Tests, *see* Diagnosis and evaluation *and specific testing procedures*
Therapy and management
of CDH, *see* Therapy and management of CDH
of cerebral hemorrhages, 416-417
of G6PD, 362-363
of hyperbilirubinemia, *see* Chemoprevention of neonatal hyperbilirubinemia; Phototherapy of neonatal hyperbilirubinemia
of neonatal apnea, 277-278
of neonatal systemic hypertension, 143-144
preventive, *see* Preventive therapy
see also Neonatal surgery for congenital anomalies; Pharmacotherapeutic agents; Therapy and management of neonatal acute renal failure *specific conditions and therapeutic modalities*
Therapy and management of CDH, 178-181
with antenatal steroids, 178-179
with ECMO, 180
with iNO, 189-190
long-term follow-up on, 181
overview of, and controversies on, 178
with perfluorocarbons, *see* Perfluorocarbons for CDH
with permissive hypercapnia, 187-188
with surfactants, 179
with surgery, *see* Congenital diaphragmatic hernia, surgery for
Therapy and management of CDH, 178-181 (*Continued*)
with ventilation, *see* Ventilation for CDH
Therapy and management of NEC, 226-230
antibiotic, 227, 228
medical, 226-227
preventive, 229-230
surgical, 227-228
Therapy and management of neonatal acute renal failure, 117-121
to decrease injury and promote recovery, 120-121
medical, 117-119
with renal replacement therapy, 119-120
Therapy and management of neonatal cholestasis, 351-353
and of associated biliary atresia, 353-354
and associated pruritus, 352
nutritional, 352
with phototherapy, 352-353
Thick ascending limb, neonatal sodium transport by, 94-95
Third trimester pregnancy dating with ultrasound, 3-4
Thoracoscopy, neonatal minimally invasive, 212-213
Three-dimensional (3-D) ultrasound
of fetal liver and renal size, 13-14
fetal weight assessment with, 6-7
Thyroxine, 344
Timing of delivery of IUGR fetus, 62, 74-75
Tin mesoporphyrin (stannsoporfin) for neonatal hyperbilirubinemia, 365-368
Tissue-engineering applications in neonatal surgery for congenital anomalies, 164-173
bioartificial liver and diaphragm surgery, 169
cardiothoracic surgery, 165-167
engineered tissue as bulking agents, 167
esophageal surgery, 168-169
gynecological surgery, 170
intestinal surgery, 168
orthopedic surgery, 170
plastic surgery, 170-171
tracheal surgery, 169-170
urologic surgery, 167-168
TLV (total liquid ventilation) with perfluorocarbons for CDH, 191
Tocolysis in fetal surgery, 199-201
Tomography, computed, of perinatal brain injury in preterm infants, 435-436
Total bilirubin concentration (TBC), effects of initial, on efficacy of phototherapy of neonatal hyperbilirubinemia, 329
Total liquid ventilation (TLV) with perfluorocarbons for CDH, 191
TOW ("term optimal weight"), 33, 34
Toxicity, *see* Bilirubin-induced neurotoxicity in preterm infants; Excitotoxicity; Nephrotoxic acute renal failure
Tracheal surgery, neonatal, tissue-engineering techniques used in, 169-170
Tracheoesophageal fistula, neonatal, *see* Esophageal atresia and tracheoesophageal fistula, neonatal
Transcription factors, role of, in congenital anomalies, 152
Transfusions, *see* Exchange transfusions, neonatal
Transient hypoxia, neonatal, in developing brain, apoptosis and neurogenesis after, 257-263
in vitro, 258-260
in vivo, 260
Transport
of critically ill neonates for surgery, 234-235
renal Na^+, *see* Renal Na^+ transport, neonatal
Trimethoprim-sulfamethoxazole, 354
TTTS (twin-twin transfusion syndrome), fetal surgery for, 200-201
Tubular Na^+ (sodium) transport, neonatal, 92-95
distal convoluted, 94-95
proximal, 92-94
Tubular necrosis, vasomotor nephropathy, acute, neonatal acute renal failure and, 113, 115-116
Tubular urinary flow rate, and net K^+ transport in CCD, 108
Tubulogenesis, renal drug transporter expression and, 137

Twin(s), fetal surgery of
of discordant twins, 202
of monozygotic twins, 200
Twin reversed arterial perfusion syndrome, fetal surgery for, 201-202
Twin-twin transfusion syndrome (TTTS), fetal surgery for, 200-201
Type 2 diabetes, later adult, relationship between fetal growth disorders and, 81, 84-87

UDCA (ursodeoxycholic acid) for neonatal cholestasis, 352
UGT promoter polymorphism (Gilbert's syndrome) in G6PD, 360-361
Ultrasound
cranial, of perinatal brain injury in preterm infants, 434-435
of neonatal cholestasis, 351
see also Ultrasound, fetal
Ultrasound, fetal
of CDH, 175-176, 178
pregnancy dating with, 3-4, 33, 52
see also Doppler ultrasound, fetal; Ultrasound assessment of fetal growth
Ultrasound assessment of fetal growth, 3-22, 39
assessment methods other than, 10
of early fetal growth, 41-43, 45, 46
fetal weight estimation with, 4-7
fetal weight percentile estimation with, 7-10
and of fetal well-being, 14-15
of macrosomia, 15-17
see also Ultrasound assessment of IUGR
Ultrasound assessment of IUGR, 10-15
arterial and venous Doppler, 12, 14-15, 67, 69-74, 76
due to placental diseases, 72
see also Intrauterine growth restriction, Rossavik growth model assessment of
Unexplained stillbirths, customized fetal growth standards used in, 38
Urethra surgery, neonatal, tissue-engineering techniques used in, 167
Urinary bladder surgery, neonatal, tissue-engineering techniques used in, 167
Urinary flow rate, tubular, and net K^+ transport in CCD, 108
Urologic surgery, neonatal, tissue-engineering techniques used in, 167-168
Uropathy, obstructive, fetal surgery for, 207-209
Ursodeoxycholic acid (UDCA) for neonatal cholestasis, 352
Uterine blood flow, *see* Uteroplacental insufficiency, IUGR due to
Uteroplacental insufficiency, IUGR due to, 11, 12, 64, 68-71
circulatory findings on, 69-70
consequences of, 68-69
fetal biophysical profile and, 70-71, 76
fetal well-being and, 14-15

Vaginal surgery, neonatal, tissue-engineering techniques used in, 170
Vascular effects, cerebral, of PC, 392
Vascular insufficiency, placental, IUGR and, 68-69; *see also* Uteroplacental insufficiency, IUGR due to
Vascular insults, and neonatal acute renal failure, 113, 117
Vascular reactivity and sensitivity to catecholamines, age-related changes in neonatal blood pressure, cardiac output and, 145
Vasomotor nephropathy/acute tubular necrosis (ATN), neonatal acute renal failure and, 113, 115-116
Venous access, bedside installation of, in critically ill neonates, 235
Venous Doppler ultrasound of IUGR, 12, 14-15, 67, 69, 74, 76
Ventilation for CDH
Intratracheal Pulmonary, 188-189
liquid, *see* Liquid ventilation for CDH
mechanical, 178-180
see also Extracorporeal membrane oxygenation
Vernix caseosa, antimicrobial peptides in, 307
Visual Motor Integration (VMI) test, results of, associated with size of CC in preterm neonates, 283
Vitamin(s) for neonatal idiopathic hepatitis, 354
Vitamin A, 230, 352
Vitamin D, 352
Vitamin E, 352
Vitamin K, 336, 352
VMI (Visual Motor Integration) test, results of, associated with size of CC in preterm neonates, 283
Volume, brain
of cortex, long-term effects of chronic neonatal hypoxia on, 379-388
measurements of, with MRI, in preterm infants with perinatal brain injury, 437-438
Volume expansion, intravascular, for abnormal uterine blood flow, 74

Weight, *see* Birth weight; Brain weight; Fetal growth disorders
Weight curve, in utero, term weight prediction and, 34
Weight percentile, fetal, ultrasound estimation of, 7-10
Well-being, fetal, ultrasound assessment of, 14-15
White matter injury, *see* Periventricular white matter injury in preterm infants

Xanthines, 277

Zaprinast, 190
Zebrafish, molecular mechanisms underlying congenital anomalies in, 153-154